

A FURTHER REVIEW OF THE AVIAN FAUNA OF
CHESTER COUNTY, SOUTH CAROLINA.

BY LEVERETT M. LOOMIS.

(Continued from Vol. VIII, p. 173.)

OBSERVATIONS ON MIGRATIONS.*

December and January.—The migrations may scarcely be said ever to be at a complete standstill in this region. Every month of the year witnesses migratory movements. In December and January both northward and southward movements are alternately manifested, each in turn obtaining the supremacy. Toward the close of the latter month, if the season be favorable, the former movement gains the ascendancy, setting more steadily northward. Temperature appears to be a controlling influence at this time of the year. Cold waves increase and warm ones diminish the abundance of some birds, especially those that winter chiefly further north—the Prairie Horned Lark for example.† Snow renders some birds particularly plentiful, others scarce; the American Pipit being entirely driven away by it. With the uncovering of the ground, however, it immediately reappears. After mild weather it sometimes happens that the Pipit, in its movements southward, waxes in numbers with cold, the severe waves sending birds from further north, yet not driving the majority south of us. The exceptional mildness of December, 1889, accelerated the progress northward. Birds that ordinarily winter rather sparingly in the Upper Country, and more abundantly in the Lower, gradually appeared in larger numbers, the Mockingbird and Pine Warbler being notable instances. The Grasshopper Sparrow also made its appearance, and some of the common birds of winter became less numerous, the Red-tailed Hawk almost wholly disappearing. In January there were feeble movements from the north during cool spells, but there was no perceptible diminution in the birds that had advanced from the

*Read at the Ninth Congress of the American Ornithologists' Union, Nov. 18, 1891.

†The previous portions of this article should be consulted where examples are cited without statement of detail.

region below. After the intervals of inclemency their numbers further increased, the Pine Warbler becoming decidedly abundant. In neither month was the Palm Warbler met with, it apparently being less susceptible to the milder influences of temperature than its congener.

The presence or absence of birds in winter cannot be explained wholly on the score of migration brought about by cold or warmth. Irrespective of these conditions, one season a particular species may be plentiful in a restricted locality, while the next it may be but poorly represented there, or even entirely wanting. Bewick's Wren well exemplifies this. A similar shifting of abode has been observed in the Purple Finch, Towhee, Brown Creeper, and others. The peculiar case of the Red-headed Woodpecker also bears upon this point. This transposition of habitat may be accounted for in part on the ground that there exists among certain species a tendency to aggregate around local centres (the contiguous territory at the time being thinly inhabited or even totally depopulated), and that these centres shift with different years. Why a locality is selected or rejected is not obvious. Birds must occupy some part of the region constituting their winter habitat, must be somewhere, and, if the conditions were alike, the choice of a particular location might be largely arbitrary. It falls within the bounds of possibility that a mere desire for change of scene, as among human beings, may have some weight in determining the selection of a winter home. On the other hand there may be causes that have escaped our discernment, which if understood, would account for much that now seems in a measure mysterious. The question of food is an all important one, but when a locality has been forsaken by any of the species mentioned there has been no visible deficiency in the food supply. The disposition, without apparent reason, to shun certain localities, save during migratory movements, further accounts for the absence of birds.

For about a week during the early part of January, 1887, the whole country, hereabouts, was suddenly flooded with Robins. They were as abundant as during the height of their northward migration. The occurrence was so unusual as to excite general remark that the Robins had come a month ahead of time. Their appearance was coincident with snow and a severe turn in the weather. With the advent of a milder season they disappeared.

At the usual time the regular migration northward took place. Their presence in the first instance finds solution, I think, in the shifting of a local centre above us, the boreal weather driving the birds southward, the pleasant weather enticing them northward again. The army of regular migrants that came later were evidently those that wintered further south. The movement of Bewick's Wrens at the close of December, 1889, may be imputed to migration northward of the birds of some local centre of abundance not far removed, the long-continued clemency bringing it about. It is assumed, as a general principle, if birds appear abruptly in the depth of winter and then again in the flush of migration, that their first coming is due to local shifting, from the north if cold, from the south if warm.

During the hard winter of 1886-87 there were great inroads of Red-tailed Hawks; the mild winter of 1889-90, as previously stated, was notable for their scarcity. Their absence in the latter season is seemingly explained by the migration of local birds occasioned by warmth that was not sufficiently far-reaching to bring the breeders and later migrants from further south to fill their places.

When the centres of distribution are small, at the extremes of range or elsewhere, a retrograde or a forward movement would result in but a slight influx in the region immediately invaded. It further follows that when a locality does not lie within the path of a north-bound community, another point further north may be sooner reached, be sooner to have recorded from it, 'first appearance.'

February to the Middle of March.—Ordinarily it is not until February that the northward movement becomes conspicuously apparent. Many winter residents are then reënforced from the region below and the departure for the north truly begins. This month is also the usual time of the opening of the song period. Unless the season is backward, by the first week there are decided signs of migration. Robins become more noticeable and Red-winged Blackbirds are found with increasing regularity, and greater activity is displayed among the hordes of Sparrows. The Meadowlark, too, grows restless. The Flicker, Pine Warbler, Mockingbird, and others begin to increase in numbers and become more generally distributed. As the days pass, if the weather is not unfavorable, the movement from the south gains

steadily in strength, the middle of the month and the third week showing marked increase in many 'resident' and winter birds, as Wilson's Snipe, Vesper and Field Sparrows, Cardinal, etc. The hosts of Robins and Blackbirds also arrive, and females become more numerous in species represented in winter chiefly by males. In forward seasons straggling Grasshopper Sparrows make their appearance. By the end of the month the flood tide of the Robin migration is reached. Other birds have been continually strengthened, and a few, as the Bluebird, have waned. The dates given are the approximate average, an open or backward season manifesting corresponding earlier or later ones. The fluctuations in abundance of winter birds, which arise from the passage of successive waves northward, begin to be apparent in this month. At this time of the year the cold is rarely ever of sufficient duration to cause pronounced movements from the north. A few Prairie Horned Larks, however, respond to the severer waves, and the advancing migrants are sometimes forced back, the scale of local abundance ascending somewhat as in a forward movement. A descent of temperature usually produces but little effect upon the birds that have come up from the region below, though protracted inclemency retards further advance.

During the first half of March the migration is chiefly a continuation of the movements of February. The birds that winter mainly below receive further accessions. Other winter residents decline, or exhibit variations in abundance as the waves roll northward, a considerable hiatus often existing between the different advances of a species. Cold sometimes checks the migration as in February, holding it in abeyance, but rarely, if ever, bringing about slight regurgitating movements.

Middle of March to the Middle of June.—With the coming of the Black-and-white Warbler, about the 15th of March or during the week following, begins the regular migration of birds that are never found in this locality in the winter. But a few days behind this Warbler arrive the first Blue-gray Gnatcatchers. Both usually become very numerous during the last portion of the month. Bachman's Sparrow, the Yellow-throated Warbler, Maryland Yellowthroat, White-eyed Vireo, Henslow's Sparrow, Bartramian Sandpiper, Parula Warbler, Yellow-throated Vireo, and Black-throated Green Warbler also make their appearance at the end of the month, about as in the order named. The last

three, however, are essentially April birds as to the time of their first arrival. Some of the constant winter visitors diminish greatly during the closing fortnight, successive waves characterizing their decline. The aftermath of the Robin migration, too, continues in a similar manner through this month. Other species, again, simply display fluctuations. Some of the irregular and uncommon birds, wintering chiefly in the region below, as the Brown Thrasher, now become prominent, unless delayed. The breeding season proper normally opens in this month, particularly during the last half of it.

The ordinary spasmodic returns at this time of the year to cooler temperature have not been found to exercise great influence upon the migrations, the birds usually being but little affected by such vicissitudes. When once under headway they stubbornly hold their ground. Prolonged inclemency, which is now exceptional, is more potent, however, impeding the movement during its prevalence. While the most forward seasons have been the mildest, it has not invariably been true that an open spring was accompanied by corresponding early migratory movements from the south. Other agencies, aside from local cold, have sometimes, apparently, arrested advance. The backward spring following the phenomenally mild winter of 1889-90, considered in connection with other years, showed that the later migrations, those of the Black-and-white Warbler, etc., are directly accelerated or retarded by the immediate meteorological conditions, and not by the remote ones. Late dates of first arrival, in individual species, are not to be accounted for solely, I believe, by phases of the weather, as is evidenced by the case of the Yellow-throated Warbler which varies considerably in its coming in different years when other early migrants are on time. Other causes, as a variation within narrow limits in the line pursued by the vanguard, may bring about these apparent delays. It may further be stated, in general, if the van of migration was held back immediately below a point, the territory nearest above might be passed over for the time being, and a locality further north be the first stopping place, and hence exhibit an earlier record.

The migrations gather force through April onward until about the first of May, or the first week of May, when the falling off commences. The winter birds (migrants really) now finally disappear; some, as the Slate-colored Junco, about the first or

second week of April, others, as the Hermit Thrush, after the middle of the month. A few linger well on into May, as the Savanna and White-throated Sparrows and the American Pipit. During April the Myrtle Warbler (an abundant winter resident) attains its greatest abundance, illustrating the increase, from the bulk below, of a species wintering here in numbers. The American Crow, a 'permanent resident,' does not altogether complete its migration until the early part of April, though its breeding season is well under way. The Robin migration closes about the middle of the month, straggling parties bringing up the rear. Summer birds continue to arrive, the majority of individuals in some species passing further north. Transients vanish and others take their places. In all waves are typically exemplified. From the foregoing it will be seen that 'winter residents,' migrants, and breeders overlap. The general dispersion of early breeding birds, and later ones as well, which occurs after the young are hatched, contemporaneously with the northward movement, is not to be ascribed, of course, to reinforcement through migration, either northward or southward, nor is their comparative scarcity during the interval of confinement to the vicinity of the nest to be attributed to the opposite cause, withdrawal from the locality.

After the first week of May the decline in the migrations becomes very evident. New arrivals ('firsts') cease to appear. The scale of abundance among most transitory visitants rapidly descends; in a few, however, as the Bobolink, the failing point is often not reached until about the 15th. With the progress of the month, wider and wider gaps occur between the waves, and by the first of June the rear guard consists only of stragglers. The young in most species are now hatched and many are abroad. By the middle of June the period of song in some birds begins to wane, and generative organs to deteriorate, and incipient bird gatherings to form, — all portending southward movement.

Middle of June to November.—The departure of adult birds of certain species, as the Black-and-white Warbler, at the close of their season of reproduction inaugurates the southward migration in this region.* The precise time when old birds leave

*It is not intended to impart the idea that the young, in varying numbers, do not, in some instances, accompany the adults.

varies. Those that have been hindered from any cause in bringing up young are later in starting than other representatives of the same species. Some species finish breeding early, and depart early, while others are tardy breeders or normally raise second broods. That second broods, however, are habitually reared by but comparatively few species in this vicinity, is my firm conviction. Of recent years my attention has been so largely fixed upon other lines of field work that I have not been able to devote the careful observation necessary to determine, even with approximate exactness, the time when the first stages of movement take place in each species breeding here. About the 20th of June, however, if not a little sooner in some years, appears to be the date of the inception of the migration.*

With July come the first Warblers that are not known to breed hereabouts, — the American Redstart, Worm-eating Warbler, Louisiana Water-thrush. All, however, rear their young near by in the mountains. It is worthy of note, that all these early comers, that I have taken, and others in August, have been birds-of-the-year. They were probably stragglers of short migration, the adults having previously passed over us in their southern flight. In evidence of this, it should be mentioned that at Mt. Pinnacle and Cæsar's Head the adults of the Louisiana Water-thrush disappeared about the middle of June. Furthermore, a number of common summer residents of the Southern Alleghanies pass in their migration southward without stopping in this locality, being rarely or never detected. Circumstances similar to this case of the prior occurrence of hornotines have very likely led to the belief, entertained by many, that the young precede the old in journeying southward.†

The migratory impulse is further manifested in July by the continued desertion of summer residents. Toward the end the

*In this connection note the arrival of Warblers in July at Key West, *Scott*, Auk, Vol. VII, pp. 16-22.

†From the very nature of the case it cannot be affirmed with certitude that the first arrivals at a given location (particularly one having a great stretch of territory to the northward) are the first birds that have migrated from any common starting point — the place of breeding. On the contrary, when adult birds have grown scarce in a locality and the young remain in force, and there have been no fluctuations in abundance indicating movement from above, and adults of the same species occur soon after in the region lying to the southward of the breeding range, it does seem to be proven that the young do not migrate earlier than their parents.

Orchard Oriole and Summer Tanager take their departure. The gathering of clans of Red-winged Blackbirds and their subsequent disappearance form one of the closing features of the month. Birds similar to the breeding ones, also, begin to appear from localities above as the month progresses. The Black-and-white Warbler, Parula Warbler, and Blue-gray Gnatcatcher are examples. The first song period draws rapidly to a close with July. In the study of the beginnings of the southward migration, the waning of the song season tends to convey an erroneous idea of rarity in many birds, owing to their diminished prominence, while on the other hand the formation of gatherings and the general distribution incline to create an impression of increased abundance. The inroads of birds of like kind to those that breed are also to be taken into account — migrants not being mistaken for denizens.

August, from the outset, is a month of extensive movements in this region. The waves of migration, and they are sharply defined, bring many species that have grown scarce, or varied in abundance, since their season of breeding was over. Some reappear in limited numbers, never reaching their previous prominence, as the Orchard Oriole, Summer Tanager, Prairie Warbler, etc. Others become more plentiful than they were before, as the Chuck-will's-widow, Whippoorwill, Loggerhead Shrike, Yellow-throated Vireo, Parula Warbler, Carolina Chickadee, Blue-gray Gnatcatcher, etc. In all intervals of paucity are conspicuous. In certain birds, as the Yellow-throated Warbler, there is a period of absence, more or less marked, between the going of the breeders and the coming of the migrants. The Ovenbird, Cerulean Warbler, Blackburnian Warbler, Chestnut-sided Warbler, Golden-winged Warbler, and Bobolink arrive — the first three in the early part of the month. All occur intermittently and, with the exception of the Ovenbird, Chestnut-sided Warbler, and Bobolink, very sparingly. Wilson's Thrush has been taken in two instances during the last week of this month. Of July birds, the American Redstart and Worm-eating Warbler are at times fairly numerous, the former especially. From the study of the after movements it seems safe to say that the August migrants are from territory not far distant. Reproduction here practically ceases with August. It is only the few tardy species and second breeders that protract it even to this length.

With August, likewise, essentially terminates the season of first song, — the singing of the last of the summer residents coming to an end. Before the conclusion of the first season, the second begins in the efforts of the young and the returning migrants, summer species. The opening of this second period is typically illustrated in the Mockingbird about September 1, or a little later. A great influx of this species takes place during August. From the first or second week onward they swarm the hedgerows, plum thickets, and roadsides. The late breeders — Blue Grosbeak, etc. — commence to depart at the termination of this month. About September 1, the Blue-gray Gnatcatcher passes the point of culmination. It carries on, however, nearly or quite to the end of the month.

Through September the tide of migration continues to rise, the high-water mark being reached about the first week of October. 'Resident' and summer species alternately wax and wane with the swell and fall of the current. Most of the latter decrease before the close of the month, as the Red-eyed Vireo. Some, as the Orchard Oriole, altogether cease to appear. Of the former, many grow more numerous, as the Flicker and Bewick's Wren. Among the purely transients, August arrivals are in the ascendency, waves following waves in frequent succession. Some of these earlier birds of passage now gain their maximum abundance, as the Chestnut-sided Warbler and American Redstart. The new ones come mainly after the first week, in most cases attaining extreme numbers in October, as the Black-throated Blue, Black-throated Green, and Palm Warblers. The appearance of the Savanna Sparrow, well to the close of September announces the coming of winter birds. Belated broods and migrants of the same species sometimes overlap. An instance of this sort is recalled in the Blue Grosbeak. A family of young, unsteady of wing, under the care of the mother bird was observed September 4, 1888. The day before a party of migrants were seen, — adjudged migrants because of the time of year and their manner of behavior. They flew high in air, coming from the northward, and alighted in a body on the summit of a giant pine, blasted and weathered. Their whole mien and conduct were entirely at variance with summer demeanor.

A striking feature in the southward migration in this region is the collection of the woodland birds into gatherings led by Tufted

Titmice and Carolina Chickadees.* In a typical gathering there will be associated with a band of these birds a few White-breasted Nuthatches, one or more Downy Woodpeckers, and a multitude of Warblers, Vireos, etc. On different days, these gatherings vary in aspect, species temporarily predominant giving to each a distinctive character. Thus, July 31, 1888, the Blue-gray Gnatcatcher was the prevailing bird; August 8, the Parula Warbler; September 11, the Blackburnian Warbler. The last, also, was the characteristic bird September 24 of the previous year. Examples of this sort might be cited indefinitely. So constant are these gatherings, that when they have not been detected—a considerable tract of territory being traversed and groups of Titmice and Chickadees found—it has been regarded proof that no movement of importance of woodland birds has taken place.† In spring these assemblages are prominent at the outset, but usually after the first of April the migrants form oases, or islands, in the woods rather than compact bodies moving synchronously.

The ebbing of the southward migration begins soon after the first week of October. It is more gradual than the decline in the opposite movement, bearing closer resemblance to that movement at its commencement. The last of the strictly summer species finally withdraw. Several, as the Red-eyed Vireo, loiter on toward the end of the month. Transients as first arrivals are replaced from the start almost exclusively by species that reside during the winter, the Yellow-bellied Sapsucker, Song Sparrow, Myrtle Warbler, and American Pipit being examples. At the middle of the month, unless their departure has been hastened, the Parula, Black-throated Blue, Blackpoll, and Black-throated Green Warblers are present in force. Through the third week there are still quite a number of typical migrants remaining, some of them continuing fairly numerous. The last week is one only of stragglers, as the Blue-headed Vireo, Cape May Warbler,

*The subject of bird gatherings in the migrations will be considered at greater length in a subsequent paper.

†This statement, or any former one implying oscillatory movement, is not in any sense to be construed as conflicting with the theory of a continuous current of migration setting steadily southward; the phenomena described being simply local manifestations. A simile is perhaps found in a vast army of Crows on their way to roost, great flocks being connected by straggling columns in one unbroken array.

Black-throated Blue Warbler, Blackpoll Warbler, Black-throated Green Warbler. During the last half of the month, all the regular winter sojourners are represented (the Prairie Horned Lark and a few others perhaps excepted) — some by large numbers, as the Song Sparrow and Golden-crowned Kinglet. The Flicker, toward the middle of the month, and the Ruby-crowned Kinglet, at the close, exemplify the diminution, in its beginning, of 'resident' and winter birds most abundant as migrants.

The Parula Warbler serves well as a type of the whole southward movement. As a breeder it is only tolerably common. In July it begins to grow more numerous. Increasing through August, it finally attains its greatest numbers in September and early October. During all these months fluctuations are constant, and they may well be supposed to indicate waves of migration; each rise in the scale of abundance signifying arrival of birds from territory farther and farther north, and each fall, departure for the south. Among strictly transient species the migration is epitomized, likewise, in the Blackburnian Warbler, its sojourn having extended from August 8 to October 22. The appearance of the Red-breasted Nuthatch — a summer dweller in the higher mountains of North Carolina — at the end of September seems to throw additional light upon the source from which the later and earlier migrants are drawn. The Wood Thrush during the last days of September and first part of October furnishes a striking instance of the reappearance of birds after a well-defined period of absence, the intervening gap being accounted for by the passing over of the inhabitants of the nearer localities. The oscillations of the earlier season continue to the close of the migration.

November.—What February and the first half of March are to the northward movement, November is to the southward. The opening fortnight witnesses the full tide of Blackbirds, the Red-winged returning after a long void but imperfectly broken since the breeding season. The Meadowlark reaches its height and wanes, and most other winter birds come to their complete measure of abundance. About the 15th the topmost wave of this closing migration recedes, and the subsidence to winter numbers takes place, and the refugees from the northern blasts appear, and, at last, the contest of movements begins anew. In November, too, occur loiterers, chiefly species wintering not far below,

as the Grasshopper and Henslow's Sparrows, Blue-headed Vireo, etc. Prolonged warmth holds some birds here and further north in abundance greater than is usual. The effect of temperature is illustrated in the Mockingbird. At the beginning of October, 1889, they were abundant, but a sharp turn and heavy frost drove all but winter numbers southward before the week was over. The year before, when exceptionally mild, they had not reached this basis on the 24th, although diminished by a cool wave and slight frost that came September 30. It appears to be true that an early cool spell is more potential with certain species than subsequent protracted mildness—the bulk retiring before the chill instead of tiding it over. The genial weather later, however, may encourage other species coming from further north to remain in larger numbers than they would if it were ordinarily cold.

(*To be continued.*)

A PRELIMINARY LIST OF THE BIRDS OF THE GRAY'S HARBOR REGION, WASHINGTON.

BY R. H. LAWRENCE.

GRAY'S HARBOR lies on the Pacific Ocean in the extreme western part of Chehalis County, Washington, about forty miles north of the mouth of the Columbia River. It is the most northern of the few safe and large harbors between San Francisco and the Straits of Fuca. The harbor drains a large area, is bordered by much marshy land, and, being large and mostly shallow, shows when the tide is low a vast expanse of mud-flats cleanly cut by the two main channels—the north and the south. These channels separate inside the bar and run eastward till they join again near Aberdeen. The harbor is about sixteen miles long east and west, by twelve north and south at its western end, narrowing much toward its eastern end. It is protected from the sea by two long, narrow, sandy points, Point Brown on the north and Point Chehalis on the south. Its largest river, the Chehalis, rises in the Cascade Mountains near Mount Rainier, and is navigable by steamers for twenty miles or more. The Humptulips,